

Lake Seminole: A Sentinel of Upstream and Downstream Water Quality in the ACF Basin

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The current drought and long-term discussions regarding water allocation in the Apalachicola-Chattahoochee-Flint (ACF) basin has raised concerns about the ecological integrity of this aquatic network in light of increasing water use and climate change. The Chattahoochee and Flint rivers merge at the convergence of Georgia, Florida, and Alabama forming Lake Seminole, a 37,000 acre shallow impoundment. Water discharged from Lake Seminole into the Apalachicola River is regulated by the Jim Woodruff Lock and Dam. Lake Seminole provides numerous ecosystem goods and services to people and is relatively well studied from the standpoint of fisheries and flood control. However, the role of Lake Seminole in processing nutrients derived from upstream sources has not been adequately addressed. The Chattahoochee and Flint rivers have similar geological history and climate but differ greatly in distributions of human populations, land-use, dams, sewage treatment discharges, and hydrological variability. To compare these drainages, we are conducting an integrative analysis of nutrients, river discharge, reservoir residence times, and productivity over periods of changing hydrology. Our preliminary assessment indicates that, at times, Lake Seminole serves as an important sink for both nitrogen and phosphorous. Given the changes in both urban and rural land use, the effects of increasing water use on hydrology, and the consequences of nutrient enrichment, it becomes imperative to understand how changes in water quality will affect the ecology and economy throughout the ACF basin.